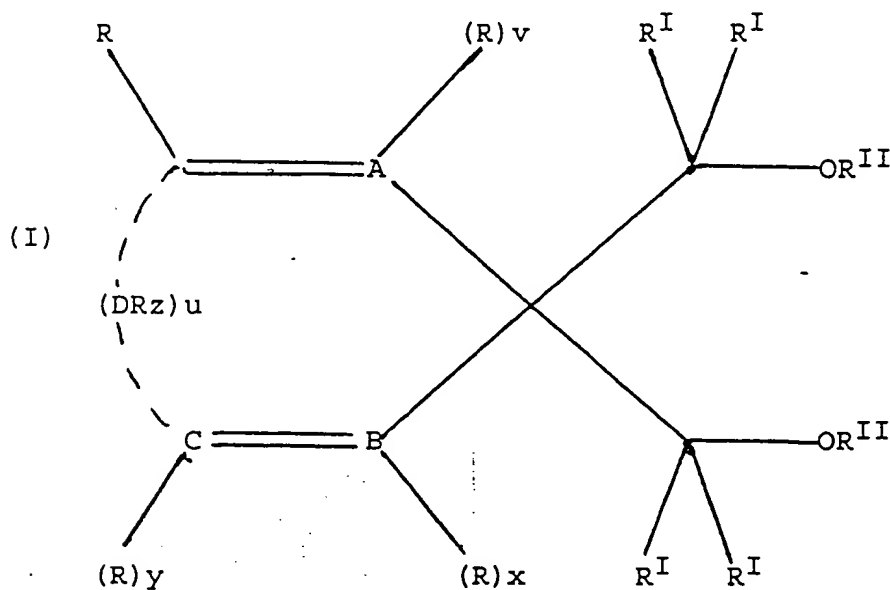


## CLAIMS

1. A solid catalyst component for the polymerization of olefins, comprising a magnesium halide in active form, and, supported thereon, a titanium compound containing at least one Ti-halogen bond and a cyclopolyenic 1,3-diether in which the carbon atom in position 2 belongs to a cyclic or polycyclic structure made up of 5, 6, or 7 carbon atoms, or 5-n or 6-n' carbon atoms, and respectively n atoms of nitrogen and n' heteroatoms selected from the group consisting of N, O, S and Si, where n is 1 or 2 and n' is 1, 2 or 3, said structure containing two or three unsaturations (cyclopolyenic structure) and optionally being condensed with other cyclic structures, or substituted with one or more substituents selected from the group consisting of linear or branched alkyl radicals; cycloalkyl, aryl, aralkyl, alkaryl radicals and halogens, or being condensed with other cyclic structures and substituted with one or more of the above mentioned substituents which can also be bonded to the condensed cyclic structures; one or more of the above mentioned alkyl, cycloalkyl, aryl, aralkyl or alkaryl radicals and the condensed cyclic structures optionally containing one or more heteroatoms as substitutes for carbon or hydrogen atoms, or both.

2. The solid catalyst component of claim 1, where the carbon atoms in positions 1 and 3 in the cyclopolyenic 1,3-diether are secondary.
3. The solid catalyst component of claim 1, where the substituents in the cyclopolyenic 1,3-diether are selected from the group consisting of linear or branched C<sub>1</sub>-C<sub>20</sub> alkyl; C<sub>3</sub>-C<sub>20</sub> cycloalkyl; C<sub>6</sub>-C<sub>20</sub> aryl; C<sub>7</sub>-C<sub>20</sub> aralkyl and C<sub>7</sub>-C<sub>20</sub> alkaryl radicals; Cl and F.
4. The solid catalyst component of claim 1, where the cyclopolyenic 1,3-diether is selected from the compounds of the general formula:



where A, B, C and D are carbon atoms or heteroatoms selected from the group consisting of N, O, S and Si; v, x and y are 0 or 1; u and z are 0 or 1 or 2;

provided that when  $u = 0$ :

i) A, B and C are carbon atoms and v, x and y are equal to 1; or

ii) A is a nitrogen atom, B and C are carbon atoms, v is equal to 0 and x and y are equal to 1; or

iii) A and B are nitrogen atoms, C is a carbon atom, v and x are equal to 0 and y is equal to 1; or

iv) A and B are carbon atoms, C is a nitrogen atom, v and x are equal to 1 and y is equal to 0;

when  $u = 1$ :

1) A, B, C and D are carbon atoms, v, x and y are equal to 1 and z is equal to 2; or

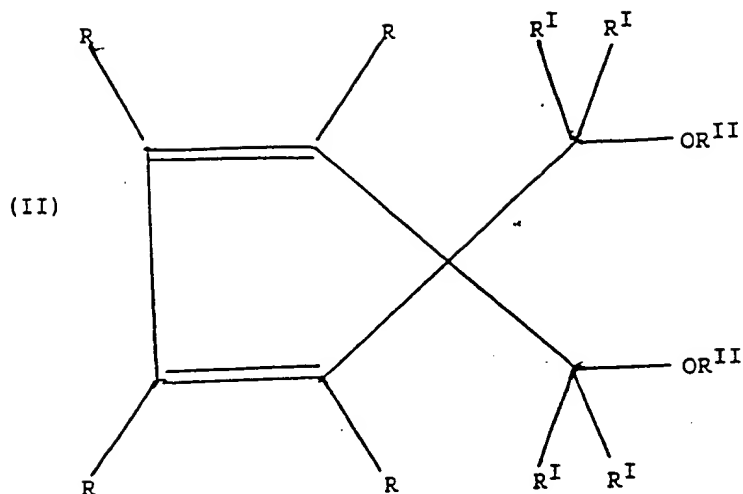
2) A and B are carbon atoms, C is a nitrogen atom, D is an oxygen atom, v and x are equal to 1, y and z are equal to 0; or

3) A, B and C are carbon atoms, D is an oxygen, nitrogen, sulfur, or silicon atom, v, x and y are equal to 1 and z is equal to 0 when D is an oxygen or sulfur atom, equal to 1 when D is a nitrogen atom, and equal to 2 when D is a silicon atom;

when  $u = 2$ :

A, B and C are carbon atoms, D represents two carbon atoms bonded to each other by a single or double bond, v, x and y are equal to 1 and z is equal to 1 when the couple of carbon atoms D is bonded by a double bond, and equal to 2 when said couple is bonded by a single bond; radicals R and R<sup>I</sup>, equal or different, are selected from the group consisting of hydrogen; halogens; C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals; the R<sup>II</sup> radicals, equal or different, are selected from the group consisting of •C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals, and two or more of the R radicals can be bonded to each other to form condensed cyclic structures, saturated or unsaturated, optionally substituted with R<sup>III</sup> radicals selected from the group consisting of halogens; C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals; said radicals from R to R<sup>III</sup> optionally containing one or more heteroatoms as substitutes for carbon or hydrogen atoms, or both.

5. The solid catalyst component of claim 4, where the cyclopolyenic 1,3-diether is selected from the compounds of the general formula:



where the radicals R and R<sup>I</sup>, equal or different, are selected from the group consisting of hydrogen; halogens; C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals; the R<sup>II</sup> radicals, equal or different, are selected from the group consisting of C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals, and two or more of the R radicals can be bonded to each other to form condensed cyclic structures, saturated or unsaturated, optionally substituted with R<sup>III</sup> radicals selected from the group consisting of halogens; C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals; said radicals from R to R<sup>III</sup> optionally containing one or more heteroatoms as substitutes for carbon or hydrogen atoms,

or both.

6. The solid catalyst component of claim 5, where the cyclopolyenic 1,3-diether is selected from the group consisting of:

1,1-bis(methoxymethyl)-cyclopentadiene;  
1,1-bis(methoxymethyl)-2,3,4,5-tetramethylcyclopentadiene;  
1,1-bis(methoxymethyl)-2,3,4,5-tetraphenylcyclopentadiene;  
1,1-bis(methoxymethyl)indene;  
1,1-bis(methoxymethyl)-2,3-dimethylindene;  
1,1-bis(methoxymethyl)-4,7-dimethylindene;  
1,1-bis(methoxymethyl)-4-phenyl-2-methylindene;  
1,1-bis(methoxymethyl)-7-(3,3,3-trifluoropropyl)indene;  
1,1-bis(methoxymethyl)-7-trimethylsilylindene;  
1,1-bis(methoxymethyl)-7-trifluoromethylindene;  
1,1-bis(methoxymethyl)-7-methylindene;  
1,1-bis(methoxymethyl)-7-cyclopenthyllindene;  
1,1-bis(methoxymethyl)-7-isopropylindene;  
1,1-bis(methoxymethyl)-7-cyclohexylindene;  
1,1-bis(methoxymethyl)-7-tert-butylindene;  
1,1-bis(methoxymethyl)-7-tert-butyl-2-methylindene;  
1,1-bis(methoxymethyl)-7-phenylindene;  
1,1-bis(methoxymethyl)-2-phenylindene;  
9,9-bis(methoxymethyl)fluorene;  
9,9-bis(methoxymethyl)-2,3,6,7-tetramethylfluorene;

9,9-bis(methoxymethyl)-2,3,4,5,6,7-hexafluorofluorene;  
9,9-bis(methoxymethyl)-2,3-benzofluorene;  
9,9-bis(methoxymethyl)-2,3,6,7-dibenzofluorene;  
9,9-bis(methoxymethyl)-2,7-diisopropylfluorene;  
9,9-bis(methoxymethyl)-1,8-dichlorofluorene;  
9,9-bis(methoxymethyl)-2,7-dicyclopentylfluorene;  
9,9-bis(methoxymethyl)-1,8-difluorofluorene;  
9,9-bis(methoxymethyl)-1,2,3,4-tetrahydrofluorene;  
9,9-bis(methoxymethyl)-1,2,3,4,5,6,7,8-octahydrofluorene;  
9,9-bis(methoxymethyl)-4-tert-butylfluorene.

7. The solid catalyst component of claim 4, where the cyclopolyenic 1,3-diether is selected from the group consisting of 9,9-bis(methoxymethyl)xanthene and 9,9-bis(methoxymethyl)-2,3,6,7-tetramethylxanthene.
8. The solid catalyst component of claim 1, where the titanium compound is selected from the group consisting of halides and halogen alcoholates.
9. The solid catalyst component of claim 8, where the titanium compound is titanium tetrachloride.
10. The solid catalyst component of claim 1, where the cyclopolyenic 1,3-diether is present in quantities ranging from 5 to 20% molar with respect to the magnesium halide.
11. The solid catalyst component of claim 1, where the Mg/Ti

ratio is from 30:1 to 4:1.

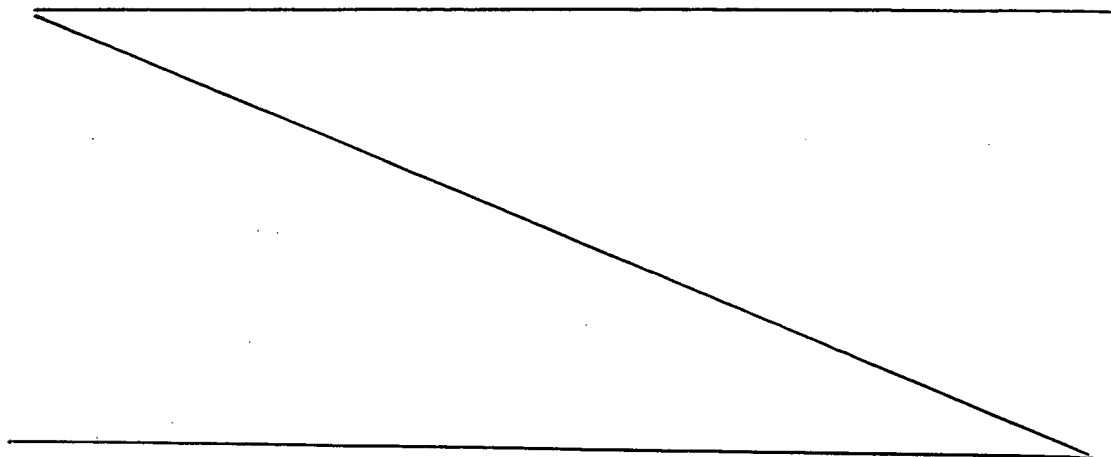
12. A catalyst for the polymerization of olefins comprising the product of the reaction of:

- a) the solid catalyst component of claim 1, with
- b) an Al-alkyl compound, and optionally
- c) an electron-donor compound other than the cyclpolyenic 1,3-diethers.

13. The catalyst of claim 12 where the Al-alkyl compound b) is an Al-trialkyl.

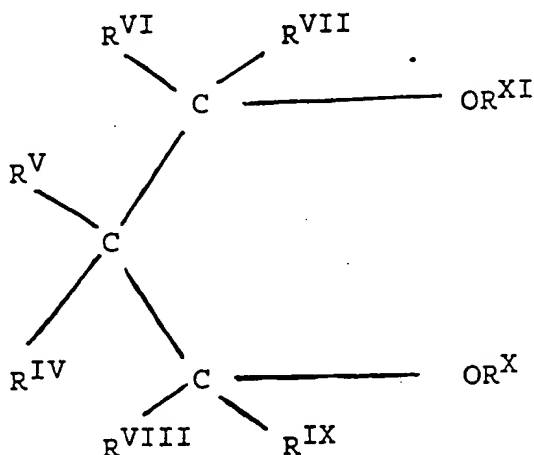
14. The catalyst of claim 12, wherein the electron-donor compound c) is selected from the group consisting of silicon compounds containing at least one Si-OR bond, where R is a hydrocarbon radical, 2,2,6,6-tetramethylpiperidine, 2,6-diisopropylpiperidine, and carboxylic acid esters.

15. The catalyst of claim 12 wherein the electron-donor compound c) is selected from the compounds having the general formula



(HM5269+HM5270+HM5271)





where  $R^{IV}$ ,  $R^V$ ,  $R^{VI}$ ,  $R^{VII}$ ,  $R^{VIII}$  and  $R^{IX}$  are the same or different, and are hydrogen; linear or branched  $C_1$ - $C_{18}$  alkyl,  $C_3$ - $C_{18}$  cycloalkyl,  $C_6$ - $C_{18}$  aryl,  $C_7$ - $C_{18}$  aralkyl or alkaryl radicals, provided that only one of  $R^{IV}$  and  $R^V$  can be hydrogen;  $R^X$  and  $R^{XI}$  have the same meaning as  $R^{IV}$  and  $R^V$  except for hydrogen, provided that when the radicals from  $R^V$  to  $R^{IX}$  are hydrogen and  $R^X$  and  $R^{XI}$  are methyl,  $R^{IV}$  is not methyl; moreover, two or more of the  $R^{VI}$  to  $R^{XI}$  radicals can be bonded to form a cyclic structure.

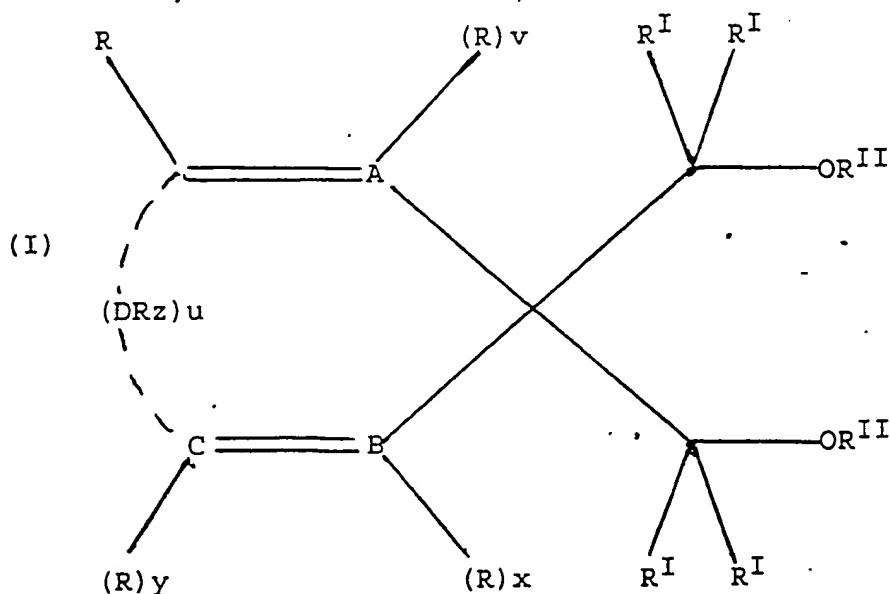
16. A catalyst for the polymerization of olefins comprising the product of the reaction between:

(HM5269+HM5270+HM5271)

- a<sup>1</sup>) a solid catalyst component comprising a magnesium halide in active form and, supported thereon, a titanium compound containing at least one Ti-halogen bond and an electron-donor compound;
- b) an Al-alkyl compound;
- c) a cyclopolyenic 1,3-diether in which the carbon atom in position 2 belongs to a cyclic or polycyclic structure made up of 5, 6 or 7 carbon atoms, or of 5-n or 6-n' carbon atoms and respectively n nitrogen atoms and n' heteroatoms selected from the group consisting of N, O, S and Si, where n is 1 or 2, and n' is 1, 2 or 3, said structure containing two or three unsaturations (cyclopolyenic structure), and optionally being condensed with other cyclic structures, or substituted with one or more substituents selected from the group consisting of linear or branched alkyl radicals; cycloalkyl, aryl, aralkyl, alkaryl radicals and halogens, or being condensed with other cyclic structures and substituted with one or more of the above mentioned substituents that can also be bonded to the condensed cyclic structures; one or more of the above mentioned alkyl, cycloalkyl, aryl, aralkyl or alkaryl radicals and the condensed cyclic structures

optionally containing one or more heteroatoms as substitutes of carbon or hydrogen atoms, or both.

17. The catalyst of claim 16, where the substituents in the cyclopolyenic 1,3-diether c) are selected from the group consisting of linear or branched  $C_1$ - $C_{20}$  alkyl radicals;  $C_3$ - $C_{20}$  cycloalkyl;  $C_6$ - $C_{20}$  aryl,  $C_7$ - $C_{20}$  aralkyl and  $C_7$ - $C_{20}$  alkaryl radicals; Cl and F.
18. The catalyst of claim 16, where the cyclopolyenic 1,3-diether c) is selected from the compounds of the general formula:



where A, B, C and D are carbon atoms or heteroatoms selected from the group consisting of N, O, S and Si; v, x, and y are 0 or 1; u and z are either 0 or 1 or 2;

provided that when  $u = 0$ :

- i) A, B and C are carbon atoms and v, x and y are equal to 1; or
- ii) A is a nitrogen atom, B and C are carbon atoms, v is equal to 0 and x and y are equal to 1; or
- iii) A and B are nitrogen atoms, C is a carbon atom, v and x are equal to 0 and y is equal to 1; or
- iv) A and B are carbon atoms, C is a nitrogen atom, v and x are equal to 1 and y is equal to 0;

when  $u = 1$ :

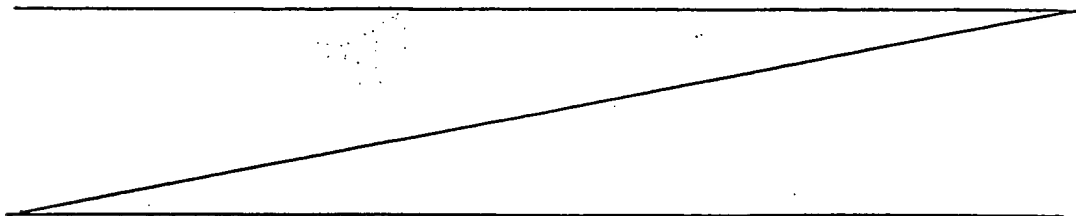
- 1) A, B, C and D are carbon atoms, v, x and y are equal to 1 and z is equal to 2; or
- 2) A and B are carbon atoms, C is a nitrogen atom, D is an oxygen atom, v and x are equal to 1, y and z are equal to 0; or
- 3) A, B and C are carbon atoms, D is an oxygen, nitrogen, sulfur or silicon atom, v, x and y are equal to 1 and z is equal to 0 when D is an oxygen or sulfur atom, equal to 1 when D is a nitrogen atom and equal to 2 when D is a silicon atom;

when  $u = 2$ :

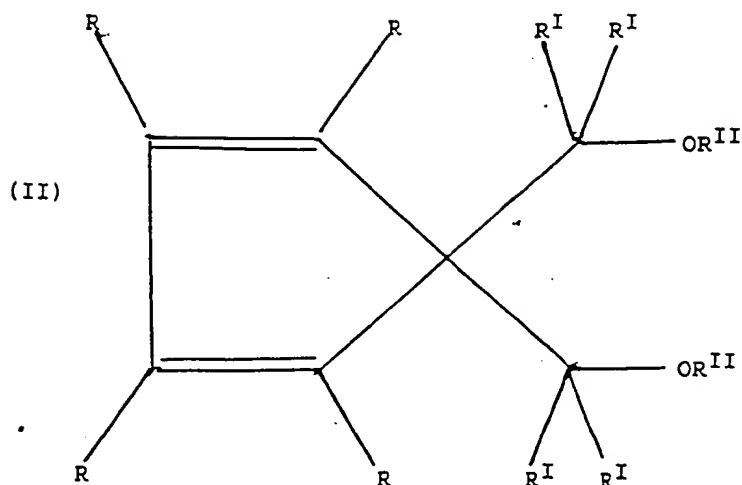
A, B and C are carbon atoms, D represents two carbon atoms bonded to each other by a single or double bond, v, x and y are equal to 1 and z is equal to 1 when the

couple of carbon atoms D is bonded by a double bond and equal to 2 when said couple is bonded by a single bond; radicals R and R<sup>I</sup>, equal or different, are selected from the group consisting of hydrogen; halogens; C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals; the R<sup>II</sup> radicals, equal or different, are selected from the group consisting of C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals, and two or more of the R radicals can be bonded to each other to form condensed cyclic structures, saturated or unsaturated, optionally substituted with R<sup>III</sup> radicals selected from the group consisting of halogens; C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals; said radicals from R to R<sup>III</sup> optionally containing one or more heteroatoms as substitutes for carbon or hydrogen atoms, or both.

19. The catalyst of claim 18, where the cyclopolyenic 1,3-diether c) is selected from compounds of the general formula:



(HM5269+HM5270+HM5271)



where radicals R and R<sup>I</sup>, equal or different, are selected from the group consisting of hydrogen; halogens; C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals; the R<sup>II</sup> radicals, equal or different, are selected from the group consisting of C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals, and two or more of the R radicals can be bonded to each other to form condensed cyclic structures, saturated or unsaturated, optionally substituted with R<sup>III</sup> radicals selected from the group consisting of halogens; C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals; said radicals from R to R<sup>III</sup> optionally containing one or more heteroatoms as

substitutes for carbon or hydrogen atoms, or both.

20. The catalyst of claim 19, where the cyclopolyenic 1,3-diether c) is selected from the group consisting of:

1,1-bis(methoxymethyl)-cyclopentadiene;  
1,1-bis(methoxymethyl)-2,3,4,5-tetramethylcyclopentadiene;  
1,1-bis(methoxymethyl)-2,3,4,5-tetraphenylcyclopentadiene;  
1,1-bis(methoxymethyl)indene;  
1,1-bis(methoxymethyl)-2,3-dimethylindene;  
1,1-bis(methoxymethyl)-4,7-dimethylindene;  
1,1-bis(methoxymethyl)-4-phenyl-2-methylindene;  
1,1-bis(methoxymethyl)-7-(3,3,3-trifluoropropyl)indene;  
1,1-bis(methoxymethyl)-7-trimethylsilylindene;  
1,1-bis(methoxymethyl)-7-trifluoromethylindene;  
1,1-bis(methoxymethyl)-7-methylindene;  
1,1-bis(methoxymethyl)-7-cyclopentylindene;  
1,1-bis(methoxymethyl)-7-isopropylindene;  
1,1-bis(methoxymethyl)-7-cyclohexylindene;  
1,1-bis(methoxymethyl)-7-tert-butylindene;  
1,1-bis(methoxymethyl)-7-tert-butyl-2-methylindene;  
1,1-bis(methoxymethyl)-7-phenylindene;  
1,1-bis(methoxymethyl)-2-phenylindene;  
9,9-bis(methoxymethyl)fluorene;  
9,9-bis(methoxymethyl)-2,3,6,7-tetramethylfluorene;  
9,9-bis(methoxymethyl)-2,3,4,5,6,7-hexafluorofluorene;

- 9,9-bis(methoxymethyl)-2,3-benzofluorene;
  - 9,9-bis(methoxymethyl)-2,3,6,7-dibenzofluorene;
  - 9,9-bis(methoxymethyl)-2,7-diisopropylfluorene;
  - 9,9-bis(methoxymethyl)-1,8-dichlorofluorene;
  - 9,9-bis(methoxymethyl)-2,7-dicyclopentylfluorene;
  - 9,9-bis(methoxymethyl)-1,8-difluorofluorene;
  - 9,9-bis(methoxymethyl)-1,2,3,4-tetrahydrofluorene;
  - 9,9-bis(methoxymethyl)-1,2,3,4,5,6,7,8-octahydrofluorene;
  - 9,9-bis(methoxymethyl)-4-tert-butylfluorene;
  - 1,1-bis( $\alpha$ -methoxybenzyl)indene;
  - 1,1-bis(1'-methoxyethyl)-5,6-dichloroindene;
  - 9,9-bis( $\alpha$ -methoxybenzyl)fluorene;
  - 9,9-bis(1'-methoxyethyl)fluorene;
  - 9-(methoxymethyl)-9-(1'-methoxyethyl)-2,3,6,7-tetrafluorofluorene;
  - 9-methoxymethyl-9-pentoxymethylfluorene;
  - 9-methoxymethyl-9-ethoxymethylfluorene;
  - 9-methoxymethyl-9-(1'-methoxyethyl)-fluorene;
21. The catalyst of claim 18, where the cyclopolyenic 1,3-diether c) is selected from the group consisting of 9,9-bis(methoxymethyl)xanthene, and 9,9-bis(methoxymethyl)-2,3,6,7-tetramethylxanthene.
  22. The catalyst of claim 16, where the Al-alkyl compound is an Al-trialkyl.



23. The catalyst of claim 16, where the titanium compound supported on the solid catalyst component a<sup>1</sup>) is selected from the group consisting of halides and halogen alcoholates.
24. The catalyst of claim 16, where the electron-donor compound supported on the solid catalyst component a<sup>1</sup>) is a Lewis base containing one or more electronegative groups where the electron-donor atoms are selected from the group consisting of N, O, S, P, As or Sn.
25. The catalyst of claim 24, where the electron-donor compound supported on the solid catalyst component a<sup>1</sup>) is an electron-donor compound that can be extracted with Al-triethyl from the catalyst component a<sup>1</sup>) for at least 70% in moles, the surface area (B.E.T.) of the solid product of extraction being at least 20 m<sup>2</sup>/g.
26. The catalyst of claim 24, where the electron-donor compound supported on the solid catalyst component a<sup>1</sup>) is a phthalic acid ester.
27. The catalyst of claim 24, where the electron-donor compound supported on the solid catalyst component a<sup>1</sup>) is an ether containing two or more ether groups and that, under standard conditions, is complexed with anhydrous magnesium chloride for less than 60 mmoles per 100 g of chloride and with TiCl<sub>4</sub> does not undergo substitution

reactions, or it only does so for less than 50% in moles.

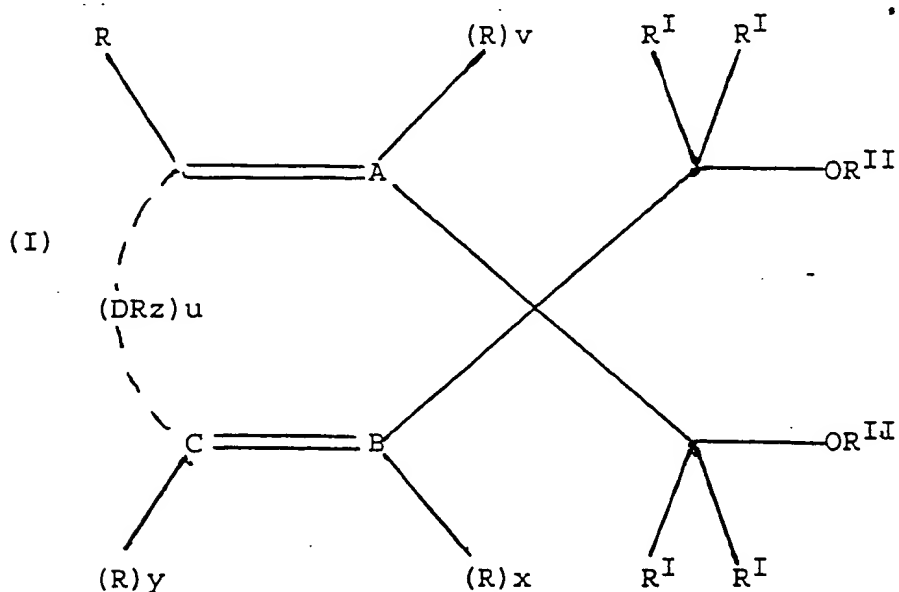
28. The catalyst of claim 24, where the electron-donor compound supported on the solid catalyst component a<sup>1</sup>) is a cyclopolyenic 1,3-diether in which the carbon atom in position 2 belongs to a cyclic or polycyclic structure made up of 5, 6 or 7 carbon atoms, or 5-n or 6-n' carbon atoms and respectively n nitrogen atoms and n' heteroatoms selected from the group consisting of N, O, S and Si, where n is 1 or 2 and n' is 1, 2 or 3, said structure containing two or three unsaturations (cyclopolyenic structure) and optionally being condensed with other cyclic structures, or substituted with one or more substituents selected from the group consisting of linear or branched alkyl radicals; cycloalkyl, aryl, aralkyl, alkaryl radicals and halogens, or being condensed with other cyclic structures and substituted with one or more of the above mentioned substituents that can also be bonded to the condensed cyclic structures; one or more of the above mentioned alkyl, cycloalkyl, aryl, aralkyl, or alkaryl radicals and the condensed cyclic structures optionally containing one or more heteroatoms as substitutes of carbon or hydrogen atoms, or both.

29. A process for the polymerization of  $\text{CH}_2=\text{CHR}$  olefins, where

(HM5269+HM5270+HM5271)

R is hydrogen or a 1-6 carbon alkyl radical or an aryl radical, or mixtures of said olefins or of said olefins and diolefins, said process being carried out in liquid phase in the presence or not of an aliphatic or aromatic hydrocarbon solvent, or in gas phase, or by combining polymerization stages in liquid phase and in gas phase, in the presence of a catalyst as defined in claims 12 and 16.

30. A diether having the general formula:



where A, B, C and D are carbon atoms or heteroatoms selected from the group consisting of N, O, S and Si; v,

(HM5269+HM5270+HM5271)

x and y are 0 or 1; u and z are 0 or 1 or 2;

provided that when  $u = 0$ :

- i) A, B and C are carbon atoms and v, x and y are equal to 1; or
- ii) A is a nitrogen atom, B and C are carbon atoms, v is equal to 0 and x and y are equal to 1; or
- iii) A and B are nitrogen atoms, C is a carbon atom, v and x are equal to 0 and y is equal to 1; or
- iv) A and B are carbon atoms, C is a nitrogen atom, v and x are equal to 1 and y is equal to 0;

when  $u = 1$ :

- 1) A, B, C and D are carbon atoms, v, x and y are equal to 1 and z is equal to 2; or
- 2) A and B are carbon atoms, C is a nitrogen atom, D is an oxygen atom, v and x are equal to 1, y and z are equal to 0; or
- 3) A, B and C are carbon atoms, D is an oxygen, nitrogen, sulfur, or silicon atom, v, x and y are equal to 1 and z is equal to 0 when D is an oxygen or sulfur atom, equal to 1 when D is a nitrogen atom, and equal to 2 when D is a silicon atom;

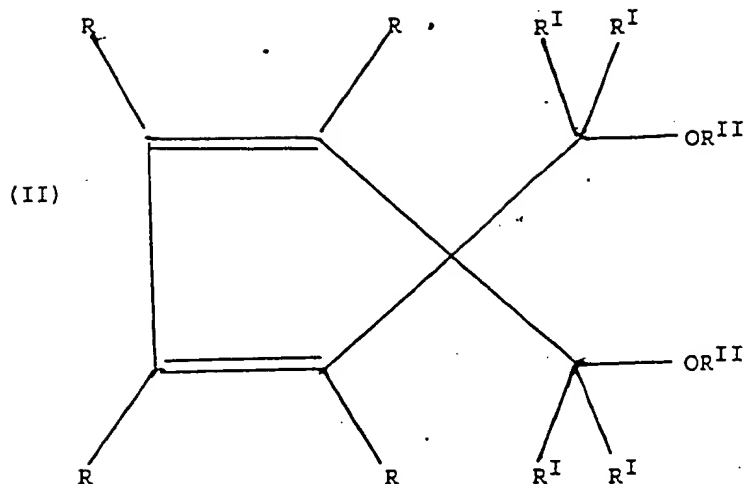
when  $u = 2$ :

A, B and C are carbon atoms, D represents two carbon atoms bonded to each other by a single or double bond, v,

x and y are equal to 1 and z is equal to 1 when the couple of carbon atoms D is bonded by a double bond, and equal to 2 when said couple is bonded by a single bond; radicals R and R<sup>I</sup>, equal or different, are selected from the group consisting of hydrogen; halogens; C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals; the R<sup>II</sup> radicals, equal or different, are selected from the group consisting of C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals, and two or more of the R radicals can be bonded to each other to form condensed cyclic structures, saturated or unsaturated, optionally substituted with R<sup>III</sup> radicals selected from the group consisting of halogens; C<sub>1</sub>-C<sub>20</sub> alkyl radicals, linear or branched; C<sub>3</sub>-C<sub>20</sub> cycloalkyl, C<sub>6</sub>-C<sub>20</sub> aryl, C<sub>7</sub>-C<sub>20</sub> alkaryl and C<sub>7</sub>-C<sub>20</sub> aralkyl radicals; said radicals from R to R<sup>III</sup> optionally containing one or more heteroatoms as substitutes for carbon or hydrogen atoms, or both.

31. The diether of formula (I) where the heteroatoms optionally present in the radicals from R to R<sup>III</sup> are selected from the group consisting of N, S, O, P, Si, Cl, or F.

32. The diether of claim 30 comprised in formula (II)



where the radicals from R to R<sup>II</sup> are as defined for formula (I).

33. The diether of claim 32, where two or more R radicals are bonded to each other to form one or more condensed cyclic structures, optionally substituted by R<sup>III</sup> radicals.
34. The diether of claim 32, where the condensed cyclic structures are benzenic structures, optionally substituted by R<sup>III</sup> radicals.
35. The diether of claim 32 selected from the group consisting of:
  - 1,1-bis(methoxymethyl)-cyclopentadiene;
  - 1,1-bis(methoxymethyl)-2,3,4,5-tetramethylcyclopentadiene;
  - 1,1-bis(methoxymethyl)-2,3,4,5-tetraphenylcyclopentadiene;
  - 1,1-bis(methoxymethyl)indene;
  - 1,1-bis(methoxymethyl)-2,3-dimethylindene;
  - 1,1-bis(methoxymethyl)-4,7-dimethylindene;

(HM5269+HM5270+HM5271)

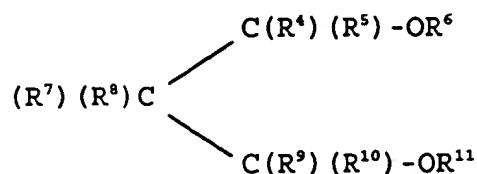
1,1-bis(methoxymethyl)-4-phenyl-2-methylindene;  
1,1-bis(methoxymethyl)-7-(3,3,3-trifluoropropyl)indene;  
1,1-bis(methoxymethyl)-7-trimethylsilylindene;  
1,1-bis(methoxymethyl)-7-trifluoromethylindene;  
1,1-bis(methoxymethyl)-7-methylindene;  
1,1-bis(methoxymethyl)-7-cyclopentylindene;  
1,1-bis(methoxymethyl)-7-isopropylindene;  
1,1-bis(methoxymethyl)-7-cyclohexylindene;  
1,1-bis(methoxymethyl)-7-tert-butylindene;  
1,1-bis(methoxymethyl)-7-tert-butyl-2-methylindene;  
1,1-bis(methoxymethyl)-7-phenylindene;  
1,1-bis(methoxymethyl)-2-phenylindene;  
9,9-bis(methoxymethyl)fluorene;  
9,9-bis(methoxymethyl)-2,3,6,7-tetramethylfluorene;  
9,9-bis(methoxymethyl)-2,3,4,5,6,7-hexafluorofluorene;  
9,9-bis(methoxymethyl)-2,3-benzofluorene;  
9,9-bis(methoxymethyl)-2,3,6,7-dibenzofluorene;  
9,9-bis(methoxymethyl)-2,7-diisopropylfluorene;  
9,9-bis(methoxymethyl)-1,8-dichlorofluorene;  
9,9-bis(methoxymethyl)-2,7-dicyclopentylfluorene;  
9,9-bis(methoxymethyl)-1,8-difluorofluorene;  
9,9-bis(methoxymethyl)-1,2,3,4-tetrahydrofluorene;  
9,9-bis(methoxymethyl)-1,2,3,4,5,6,7,8-octahydrofluorene;  
9,9-bis(methoxymethyl)-4-tert-butylfluorene.

1,1-bis( $\alpha$ -methoxybenzyl) indene;  
 1,1-bis(1'-methoxyethyl)-5,6-dichloroindene;  
 9,9-bis( $\alpha$ -methoxybenzyl) fluorene;  
 9,9-bis(1'-methoxyethyl) fluorene;  
 9-methoxymethyl-9-(1'-methoxyethyl)-2,3,6,7-tetrafluorofluorene;  
 9-methoxymethyl-9-pentoxymethylfluorene;  
 9-methoxymethyl-9-ethoxymethylfluorene;  
 9-methoxymethyl-9-(1'-methoxyethyl)-fluorene; and  
 9-methoxymethyl-9-[2-(2-methoxypropyl)]-fluorene.

36. The diether of claim 30 selected from the group consisting of:

1,1-bis(methoxymethyl)benzonaphthene;  
 9,9-bis(methoxymethyl)-9,10-dihydroanthracene;  
 9,9-bis(methoxymethyl)xanthene; and  
 9,9-bis(methoxymethyl)-2,3,6,7-tetramethylxanthene.

37. A process for the synthesis of a diether of general formula (III)

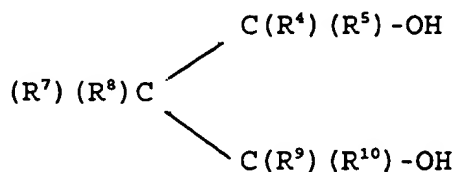


where the  $R^7$  and  $R^8$  radicals, equal or different, are hydrogen or  $C_1$ - $C_{20}$  alkyl radicals, linear or branched;  $C_3$ - $C_{20}$  cycloalkyl,  $C_6$ - $C_{20}$  aryl,  $C_7$ - $C_{20}$  alkaryl and  $C_7$ - $C_{20}$  aralkyl



radicals; the  $R^4$ ,  $R^5$ ,  $R^9$ , and  $R^{10}$  radicals, equal or different, have the same meaning as the radicals  $R^7$  and  $R^8$  radicals; the  $R^6$  and  $R^{11}$  radicals have the same meaning as defined for the  $R^7$  and  $R^8$  radicals except for the hydrogen; two or more radicals from  $R^4$  to  $R^{10}$  can be bonded to form a cyclic structure; said radicals from  $R^4$  to  $R^{11}$  optionally containing one or more heteroatoms, as substitutes for one or more carbon or hydrogen atoms, or both, selected from N, O, S, P, Si and halogens; said process comprising the following steps:

- a) mixing a diol of general formula (IV)



where the radicals from  $R^4$  to  $R^{10}$  are as defined for general formula (III), with a compound or a mixture of compounds selected from the compounds of general formulae  $R^6X$  (V), or general formula  $R^{11}X$  (VI), where X is Cl, Br, I,  $\text{CH}_3\text{SO}_3$ ,  $\text{C}_6\text{H}_5\text{-SO}_3$ , or  $\text{p-CH}_3\text{-C}_6\text{H}_4\text{-SO}_3$ , or of general formula  $(R^6)_2\text{SO}_n$  (VII), or of general formula  $(R^{11})_2\text{SO}_n$  (VIII), where  $R^6$  and  $R^{11}$  have the meaning as defined for general formula (III), and n is 3 or 4, in a solvent which is basically nonreactive toward the reagents; and then

b) adding a base which is substantially inert towards the compounds of general formula (V) to (VIII), and is capable of forming the alcoholated derivative of the corresponding diol (IV) under the reaction conditions.

38. The process of claim 37 for the synthesis of diethers of general formula (I).
39. The process of claim 37 where the base is sodium hydride or sodium hydroxide.
40. The process of claim 37, where the solvent is selected from the group consisting of tetrahydrofuran, dimethyl sulfoxide, diethyl ether, aliphatic or aromatic hydrocarbons, and dimethylformamide.